SANTA CRUZ ISLAND PRIMARY RESTORATION PLAN

SUMMARY OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

Introduction

Santa Cruz Island, the largest of the Channel Islands off the coast of Southern California, is home to a variety of wildlife including a significant number of plants and animals that can be found nowhere else in the world. Nine of its plants are listed as endangered or threatened under the Endangered Species Act. It is this uniqueness that makes Santa Cruz Island a bastion of biological diversity. An estimated 3,000 archeological sites associated with the Chumash culture are located on Santa Cruz Island. Ninety percent of the island is listed in the National Register of Historic Places (NRHP) for its archeological significance. Channel Islands National Park was established to protect and restore these nationally significant resources.

Non-native, exotic, species introduced to the island throughout the last 200 years have caused extensive damage to the island's rich resources. Without aggressive management actions to reverse the tide of degradation caused by the exotics, the island's rare biological and archeological resources are in peril of being lost forever.

This primary restoration plan proposes actions to 1) eradicate non-native feral pigs, 2) reduce the spread and presence of large populations of non-native vegetation, specifically fennel (*Foeniculum vulgare*), 3) promote the conservation and recovery of rare species of plants and animals and the habitats on which they depend, and 4) eliminate disturbance and degredation of extensive archeological resources.

Description of the Alternatives

The proposed action, Alternative Four, will reduce ecosystem and archeological site disturbance and promote species recovery through annual, phased hunting/trapping of feral pigs in fenced units island-wide. In addition, to accomplish this it will treat large stands of fennel through controlled, prescribed fire and successive treatments with herbicide. Mostly by using

existing and historical fence lines, the island will be divided into six management units of roughly 12,000 acres each. Within these units, feral pigs will be eradicated, clearing one zone before moving to the next. Priority will be given to units that have an increased risk of failure because of native vegetation recovery causing the unit to become unhuntable. Fennel treatment will be focused in areas of high fennel density that would inhibit pig removal efforts, and will be based upon the successful Central Valley Fennel Removal Project, co-funded by The Nature Conservancy and the Mellon Foundation. This protocol consists of burning large, monoculture stands of fennel to reduce standing biomass, followed by treatment with the herbicide Garlon 3A in low mix rates (0.5%-4.0%) for two successive growing seasons to kill resprouts.

Alternative Features	***Alternative One*** ***No Action***	***Alternative Two*** ***Simultaneous Island-Wide Eradication of Pigs***	***Alternative Three*** ***Eradicate Pigs from ESCI/ Exclude Pigs from Selected Sensitive Resources on C/WSCI***	***Alternative Four*** ***Sequential Island-Wide Eradication by Fenced Zone Hunting***
Pig Eradication Strategy	No Eradication Strategy would be implemented	Hunt all areas simultaneously until all pigs are eradicated	Create two pig zones: eradicate pigs in NPS zone; exclude pigs from selected resources on TNC property	Hunt and trap pigs by zone until all pigs are eradicated
Miles of Fence Construction	None	None	~10	~45
Duration of Project	0	2 years of eradication, 5 years inspect and monitor	2 years of eradication, exclude forever	6 years of eradication, 5 years inspect and monitor
Fennel Control	None	Prior to pig eradication - Burn fennel in the fall; aerially spray with herbicide two consecutive springs	Prior to pig eradication - Burn fennel in the fall; aerially spray with herbicide two consecutive springs	Prior to pig eradication - Burn fennel in the fall; aerially spray with herbicide two consecutive springs

Summary of Environmental Impacts

For each alternative action, the Park analyzed the potential environmental impacts that would likely occur. Environmental impacts were divided into the following categories: Native Plant Communities, Rare and Listed Plants, Non-native Plants, Native Island Fauna, Non-native Island Fauna, Soil and Water Resources, Cultural Resources, and Human Uses.

The Proposed Action is Alternative Four: Sequential, Island-wide Eradication by Zone Hunting. Under this alternative there would be some short-term impacts to native flora, fauna, soils, waters, cultural resources, and human uses due to the activities associate with fennel control and feral pig eradication. However, following fennel control and eradication of feral pigs from a given zone, protection of irreplaceable island resources will be immediate.

Native Plant Communities

- *Alternative One* - Fennel will continue to spread, aided by rooting pigs. Pigs will continue impacts on vegetation through rooting, accelerated soil erosion, seed predation, carrying of weed seeds, and creation of trails.
- *Alternative Two* - Fennel burn will increase soil nutrients in the short term, and kill some native plants. Fire will stimulate seed germination of some native plants. Small patches of native plants and boundary areas may experience mortality due to herbicide effects. The control of fennel and eradication of feral pigs will have substantial positive effects on native plant communities.
- *Alternative Three* - Effects from fennel burn and herbicide application same as Alternative Two. The control of fennel and eradication of feral pigs will have substantial and positive effects on native plant communities on approximately 24% of the island. Most of the island's native plant communities will be exposed to the feral pig impacts described in Alternative One.
- *Alternative Four* - The environmental consequences are substantially similar to Alternative Two. The primary difference is that the project will take approximately 4 years longer to complete and there will be impacts from fence building and removal. Effects from fennel burn and herbicide application same as Alternative Two. The control of fennel and eradication of feral pigs will have substantial and positive effects on native plant communities.

Rare and Listed Plants

- *Alternative One:* Feral pigs will continue to impact almost all known populations of listed plant species.
- *Alternative Two:* One listed plant species, *Galium buxifolium*, occurs on the isthmus where the dense fennel occurs. However, the *Galium* does not co-occur with the fennel. No burning or herbicide is planned for the coastal bluff habitat inhabitated by the *Galium* and no effect is anticipated. The nine listed plant species and numerous rare plants should all benefit from the eradication of feral pigs.

- *Alternative Three:* Some protection will be afforded to rare and listed plant species due to fencing existing populations. However, sustained protection will be difficult due to the ability of pigs to break through fencing over time. Populations will not be able to recover to new habitats because of the continued presence of feral pigs.
- *Alternative Four:* Same as Alternative Two except that it will take approximately 4 more years to achieve the feral pig eradication and protect all of the rare and listed plants.

Non-native Plants

- *Alternative One:* Non-native plants will continue to benefit from the ground disturbance activities of feral pigs. Fennel will continue to expand into native plant communities and establish dominance.
- *Alternative Two:* Fennel burn may enhance Mediterranean annual grasses. Fennel will be greatly decreased. Herbicide application will greatly reduce fennel and should reduce other non-native dicots. Removal of pig disturbance will substantially reduce long-term establishment and spread of non-native plants.
- *Alternative Three:* Environmental consequences will be similar to Alternative One: No Action for the central and western portions of the island. To the extent that pigs can be excluded from the eastern 24% of the island, the environmental consequences there will be similar to Alternative Two.
- *Alternative Four:* Same as Alternative Two. Fence building and removal will likely create some bare ground and may increase weed spread into disturbed areas near fencelines.

Native Island Fauna

- *Alternative One:* Pigs will continue to directly and indirectly impact native wildlife through destruction of habitat, predation, competition for food, supporting enhanced populations of predators (such as ravens). Island Foxes will face continued predation from non-native golden eagles.
- *Alternative Two:* There will be short-term effects on small animals due to the fennel burn. Elimination of dense fennel stands will cause changes in species composition in the long-term. Herbicide treatment is not expected to affect island fauna. Feral pig eradication will remove direct competition and predation on many island animal species. Island foxes would not face predation from non-native golden eagles nor competition for food.
- *Alternative Three:* Same as Alternative One: No Action for Island Foxes. Native wildlife, such as mice, lizards, and snakes on the eastern portion of the island will benefit (similar to Alternative Two) from the eradication of feral pigs in that area.
- *Alternative Four:* Same as Alternative Two, although approximately 4 more years will be needed to eradicate the feral pigs.

Non-native Island Fauna

- *Alternative One:* Without eradicating pigs, pigs would remain abundant on the island. This readily available food source would be adequate to support the continued nesting by non-native golden eagles. The golden eagles would continue to opportunistically prey on native island endemic species such as the island fox and the island spotted skunk.
- *Alternative Two:* Removal of pigs will eliminate the primary prey base for golden eagles. Golden eagles would no longer be able to sustain resident populations on the island.
- *Alternative Three:* Effects from fennel burn and herbicide application same as Alternative Two.
- *Alternative Four:* Same as Alternative Two, although approximately 4 more years will be needed to eradicate the feral pigs.

Soil and Water

- *Alternative One:* Pig rooting and herbivory will continue to reduce plant cover and greatly increase soil erosion and sedimentation of streams.
- *Alternative Two:* Fennel burn and herbicide will reduce ground cover and could lead to increased erosion and stream sedimentation in the short-term. Eradication of feral pigs will greatly reduce soil disturbance, destruction of cryptobiotic crusts, and lessen soil erosion and stream sedimentation. Soil nutrient levels will increase in the short-term from the fennel burn.
- *Alternative Three:* To the extent the NPS is successful keeping pigs from reinvading the eastern portion of the island, the environmental consequences in this area will be the same as Alternative Two. However, for the remainder of the island (with the exception of selected fenced areas) the environmental consequences will be the same as Alternative One: No Action.
- *Alternative Four:* Same as Alternative Two, although approximately 4 more years will be needed to eradicate the feral pigs.

Cultural Resources

- *Alternative One:* Pigs will continue to destroy irreplaceable archeological sites and will degrade the scientific values of the Santa Cruz Island Archeological District.
- *Alternative Two:* The fennel burn could affect historical resources, such as fencelines. Fire lines in fennel could cause ground disturbance. The primary impactor of archeological sites, feral pigs, would be eliminated in approximately two years.
- *Alternative Three:* Most of the Santa Cruz Island Archeological District will continue to be impacted by feral pigs. To the extent that pigs are excluded from the eastern portion of the island and fenced out of selected sites on the remainder of the island, archeological sites in those areas will be protected.

- *Alternative Four:* Same as Alternative Two, although approximately 4 more years will be needed to eradicate the feral pigs.

Human uses

- *Alternative One:* Human uses will be largely unchanged. The aesthetics of visits to Santa Cruz Island will be lessened due to the reduction of native wildlife, reduction of plant cover, and destruction of archeological sites. The scientific value of the island will decrease. Pigs may occasionally be dangerous to people in certain situations.
- *Alternative Two:* Elimination of dense stands of fennel will improve the attractiveness of the isthmus for visitor use. Visitor use and access may be limited while hunting of feral pigs is active in selected areas. Elimination of pigs will improve island aesthetics, scientific values, and recreational opportunities.
- *Alternative Three:* Environmental effects will be similar to Alternative Two for most recreational uses. The scientific value of most of the island will decrease. Pigs may occasionally be dangerous to people in the central and western portions of the island.
- *Alternative Four:* Same as Alternative Two, although approximately 4 more years will be needed to eradicate the feral pigs.

Likelihood of Success

- *Alternative One*: The Park also evaluated the "Likelihood of Success" of each of the alternatives. Alternative One No Action makes it impossible for the NPS to achieve its goals for conserving natural and cultural resources on Santa Cruz Island and restoring the natural ecosystems of the island. The facts that nine plant species from Santa Cruz Island have been listed as threatened or endangered and that island foxes have declined precipitously in recent years are indications of the destruction of native resources caused by feral pigs. Numerous archeological sites have been irreversibly damaged by feral pigs.
- *Alternative Two:* This is an excellent strategy for protecting island resources but would be very difficult to achieve because of the need to fund and support a very large operation over a short period of time. Funding realities substantially lessen the "Likelihood of Success" for this alternative.
- *Alternative Three*: This has a low "Likelihood of Success" because more than three-fpourths of the island, containing extremely significant natural and cultural resources, would continue to be subjected to feral pig impacts. Additionally, it is expected that maintaining a pig-proof fence across the island will be expensive and an exercise in futility. Pigs are very adept at breaking through fences. It is doubtful that park personnel, with all the demands and issues they face, could sustain in perpetuity the effort necessary to hold a fenceline. Once pigs breached the fence, even accomplishments on the eastern fourth would be lost.
- *Alternative Four* : This has the highest "Likelihood of Success" because it achieves the best balance of expeditiously and comprehensively protecting resources in a manner that the NPS is likely to be able to support financially and logistically. The longer time necessary to

complete the project will allow more post-sheep vegetation recovery, increasing the difficulty of feral pig eradication and slightly reducing the "Likelihood of Success".